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QC-929
ASAS

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Avalanche Notes

U.S. Forest Service
Westwide Avalanche Network

MARCH 1993

Weather

In the western U.S., March never showed lion tendencies whatsoever and remained lamb-like throughout. Snowfall was below normal in most of the West; there was no discernible storm track. In the far north, however, Alyeska, AK recorded 104% of normal snowfall.

For the third month in a row, the Cascades of Washington and Oregon had scant snowfalls. In Washington, Stevens Pass and Mt. Rainier both recorded 50% of normal, and Crystal Mt. got but 39%. Mt. Hood Meadows, OR received 52%.

Only one notable storm hit the Sierra of California, and it was highly localized: Sugar Bowl recorded 39" of snow on the 24th-25th, while nearby Alpine Meadows got 22". March was the first low-snow month in the Sierra since November. Alpine Meadows received 53% of normal snow, and Mammoth Mt., 62%.

In the Intermountain region, snowfall was well below normal. In Utah, Alta got 62%, while Snowbird got but 36% (though warm temperatures produced exceptionally high-density snows and 1" of rain at Snowbird.) In Montana, Big Mountain received 41%; Big Sky, 65%; and Bridger Bowl, 73% of normal. Jackson Hole, WY, too, received 73% of normal snow, but a warm storm on the 15th-19th dropped 31" of snow that contained 4.40" of water equivalent.

Snowfall in Colorado was a mixture of bountiful and skimpy, with the north seeing much more than the south. Copper Mt. received 150% of normal, and Berthoud Pass, 120%. The town of Winter Park, Arapahoe Basin, Breckenridge, Vail, Beaver Creek, Aspen Mt., and Gothic were all 100-110%. Aspen Highlands, Monarch, Mary Jane, and Red Mountain Pass were all 79-89%. Telluride got 68%; Sunlight, 52%; Purgatory, 42%; and Wolf Creek, 35%. Taos, NM recorded 74%. The 28th, when 12-19" fell from Taos to Copper Mt., was one of the few double-digit snow days in the region.

Avalanche

March produced little in the way of widespread avalanche hazard or incidents. Despite low snowfall, Alpine Meadows, Stevens Pass, and Bridger Bowl still had impressive avalanche counts. On the 26th, following four warm days, Bridger Bowl experienced a spectacular cycle of natural wet avalanches.

Nine avalanche incidents were reported in March, resulting in seven people caught and three partly buried. There were no injuries or fatalities. One parked car and two houses -- all in Colorado -- sustained slight damage from avalanches. Avalanche statistics through March are 133 incidents, 168 people caught, 37 partly buried, 34 buried, 11 injured, and 20 killed; 46 vehicles

caught and 11 damaged; and 15 buildings damaged. Direct property damage is estimated at about \$400,000.

DALE GALLAGHER
1932-1993

Dale Gallagher died at his home in Portland, Oregon, on March 29, following a long illness. He died of cancer of the pancreas. He was 61. He is survived by four daughters and two sons-in-law.

In early March Dale sent a letter to close friends and relatives to break the news of his cancer, which was inoperable and incurable. The next few weeks he got his affairs in order and talked to friends to affirm his thankfulness for a most rewarding and blessed life. The end came swiftly, and three of his daughters were at his side when he died peacefully on the night of March 29.

I first met Dale in 1971 at the first National Avalanche School. In 1967, Dale had written the first volume of The Snowy Torrents, and I later inherited the job of writing an additional volume. Our common interests of avalanche education and studying avalanche accidents led to a professional relationship, which in time became a close personal friendship. I thoroughly admired the man, his outgoing and friendly nature, and his strong convictions on what the professional avalanche community could and should accomplish.

And Dale accomplished more than his share. His avalanche career began with the US Forest Service in 1954 as a snow ranger at Wolf Creek Pass, Colorado, and ended 33 years later with his retirement in 1987. Along the way, he instructed summer and winter mountaineering for the US Army, did avalanche work in Colorado and Utah, and was a member of the avalanche forecasting and control team at the 1960 Winter Olympic Games at Squaw Valley, California. He wrote the first Operating Plan for a ski area, established the Silverton Avalanche School in 1962, instructed National Ski Patrol avalanche courses from 1957-72, worked with mountain rescue teams from 1955-69, and organized the Summit County (Colorado) Rescue Group in 1960. Perhaps he is best known for being the author of the first Snowy Torrents and for his work and guidance with the National Avalanche School from 1971-89 as organizer, instructor and director.

For these accomplishments, in 1991 the American Association of Avalanche Professionals awarded Dale its highest honor -- Honorary Member. Dale was a founding member of the AAAP and one of its greatest boosters.

I last saw Dale on October 8, the final day of the ISSW in Breckenridge. We had breakfast, and Dale had a gift for my wife Suz, and one for me. It was his copy of Seligman's Snow Structure and Ski Fields that he got in 1963. He said he no longer needed it and wanted it to be in good hands. I graciously accepted his bequeathment.

We stayed in touch by phone, talking several times a month. Then came the letter of March 3 with its desperate news. We last talked three days before his death. In typical fashion, he minimized his problems and emphasized the positive. We promised to talk again soon, but that didn't happen. So I'll say goodbye now, Dale. Your book is in good hands.

Knox Williams
April, 1993

U.S. FOREST SERVICE
WESTWIDE WEATHER AND AVALANCHE NETWORK
FORT COLLINS, COLORADO

MARCH 1993
SUMMARY OF WEATHER AND SNOW CONDITIONS

AREA	SNOWFALL				WATER EQUIVALENT								SNOW DEPTH				TEMPERATURE			WIND SPEED AND DIRECTION					
	TOTAL SNOW- FALL IN.	AVG DEN	MAX		TOTAL WATER IN.	MAX 24 HR. IN.	D T	NUMBER OF DAYS				D T	MIN IN.	AVG IN.	MEAN MAX DEGREES F	MEAN MIN	AVG	AVG FOR MO. MPH	6 HOUR PERIODS		FASTEST HOUR	D T			
			IN	D				GE	GE	GE	GE								15	20					
																							E		
CENTRAL AND SOUTHERN ROCKY MOUNTAINS																									
ARAPAHOE BASIN, COLO	65.6	.08	9	11	5.09	.95	11	11	9	5	0	82	31	62	71	29.1	7.4	18.2	13.2	52	16	28	300	9	
ASPEN MOUNTAIN, COLO	51.7	.09	18	28	4.60	1.70	28	9	6	4	1	90	28	70	76	35.4	15.2	25.3	7.0	1	0	20	130	27	
ASPEN HIGHLANDS, CO	42.7	.08	16	28	3.62	1.40	28	7	6	2	1	80	28	63	68	33.0	14.3	23.7	4.3	0	0	22	230	25	
BEAR LAKE, RMNP, CO	53.6	.07	10	20	3.76	1.00	20	11	9	2	1	68	16	54	61	29.2	18.0	23.6	--	--	--	--	--	--	
BERTHOUD PASS, COLO	69.5	.07	10	11	4.83	.70	28	12	10	3	0	78	31	60	68	31.2	10.7	21.0	13.4	50	14	30	230	17	
BRECKENRIDGE, COLO	59.0	.07	10	16	4.38	.80	28	12	9	2	0	74	16	57	65	24.0	9.4	16.7	14.4M	55M	17M	32	250	12	
COPPER MTN, COLO	81.0	.07	19	28	5.54	1.50	28	18	9	3	1	74	28	56	62	35.1	12.3	23.7	16.3	62	39	43	260	17	
GOTHIC, COLO	67.0	.06	13	28	4.22	.78	28	10	7	4	0	96	1	80	87	33.8	11.5	22.7	--	--	--	--	--	--	
KEYSTONE, COLO	60.3	--	15	28	--	--	--	--	--	--	--	72	29	51	58	31.7	12.4	22.1	6.9	0	0	--	--	--	
MONARCH, COLO	50.2	.09	15	28	4.64	1.50	28	12	9	2	1	84	28	22	71	32.7	14.5	23.6	20.5M	92M	71M	--	--	--	
POWDERHORN, COLO	24.5	--	9	29	--	--	--	--	--	--	--	78	1	68	71	39.2M	15.1M	27.1M	3.3M	0M	0M	15	220	18	
PURGATORY, COLO	23.7	.09	8	28	2.15	.70	28	7	5	1	0	100	1	74	82	32.5	13.2	22.9	--	--	--	17	360	12	
RED MTN PASS U.S.550	55.5	.07	12	28	4.00	.75	28	10	7	5	0	94	28	76	82	33.1M	14.0M	23.6M	--	--	--	--	--	--	
SUNLIGHT, COLO	28.0	.09	9	28	2.50	.90	28	7	4	2	0	78	1	66	71	36.9	16.9	26.9	--	--	--	--	--	--	
TAOS, NEW MEXICO	39.0	.07	12	28	2.75	.75	27	7	6	2	0	130	2	106	118	35.2	18.8	27.0	8.6	12	1	25	250	27	
TELLURIDE, COLO	42.7	.07	12	28	3.17	.80	28	10	6	2	0	77	28	59	64	30.7M	14.5M	22.6M	4.7M	0M	0M	--	--	--	
WINTER PARK 1E, COLO	45.4	.07	7	18	3.28	.62	18	9	6	1	0	60	18	49	53	39.5	15.9	27.7	--	--	--	--	--	--	
WINTER PARK S.A., CO	58.8	.08	9	11	4.48	.72	11	13	8	2	0	89	19	76	81	23.5M	13.4M	18.4M	8.6M	14M	0M	22	290	8	
WOLF CREEK, COLO	29.1	.11	9	27	3.23	1.10	28	7	4	2	2	152	1	126	136	35.9	13.8	24.9	15.7M	60M	34M	59	40	12	
INTERMOUNTAIN																									
BIG SKY, MONT	34.0	--	7	20	--	--	--	--	--	--	--	66	22	51	55	34.0M	20.1M	27.0M	5.9M	5M	1M	55	240	16	
BIG MOUNTAIN, MONT	21.0	--	6	15	--	--	--	--	--	--	--	98	21	88	92	--	--	--	--	--	--	--	--	--	
BRIDGER BOWL, MONT	44.0	.09	9	21	3.99	1.20	21	11	6	2	1	94	17	59	68	38.0	21.5	29.8	11.1M	38M	15M	25	270	6	
GRAND TARGHEE, WYO	40.5	.08	15	18	3.05	.80	18	9	7	1	0	85	18	58	66	36.6M	17.8M	27.2M	--	--	--	--	--	--	
JACKSON HOLE 1, WYO	49.1	.12	9	18	6.00	1.00	18	13	9	5	3	102	19	77	88	27.2	19.4	23.3	14.8	58	29	41	270	9	
SCHWEITZER BASIN, ID	17.0	--	3	4	--	--	--	--	--	--	--	87	21	78	82	35.2	22.1	28.6	--	--	--	60	270	15	
SNOWBIRD, UTAH	35.0	.16	8	15	6.76	1.10	18	12	9	7	1	108	2	83	93	39.8	24.7	32.2	22.9	99	76	--	--	--	
WEST COAST																									
ALPENTAL, WASH	20.5	.10	6	3	9.26	2.42	23	11	7	5	3	79	5	59	69	45.8M	30.4M	38.1M	11.8M	34M	19M	--	--	--	
ALPINE MEADOWS, CAL	35.0	.12	9	24	8.48	2.12	17	10	8	5	1	160	1	120	135	45.4	31.1	38.2	24.5	95	85	75	250	17	
ALYESKA, ALASKA	86.6	.08	11	22	7.49	1.00	5	15	12	7	1	131	11	115	120	33.5	23.9	28.7	5.2	0	0	17	330	14	
CRYSTAL MTN 1, WASH	22.7	.09	6	15	3.86	1.55	23	9	6	2	1	69	3	59	63	40.7	26.4	33.5	11.9M	31M	19M	--	--	--	
CRYSTAL MTN 2, WASH	29.6	.09	9	15	4.31	1.55	23	13	6	2	1	75	17	65	69	37.4	22.8	30.1	--	--	--	--	--	--	
EAGLECREST, ALASKA	21.5	--	6	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
HEAVENLY VALLEY, CAL	28.0	--	7	28	--	--	--	--	--	--	--	142	1	106	119	44.9	23.2	34.0	--	--	--	--	--	--	
JUNE MOUNTAIN, CALIF	32.0	.07	14	26	2.35	1.00	26	8	4	1	1	121	1	80	94	48.9	23.8	36.4	--	--	--	--	--	--	
MAMMOTH MTN, CALIF	39.1	--	15	26	--	--	--	--	--	--	--	126	1	102	111	43.4M	22.6M	33.0M	--	--	--	--	--	--	
MT. RAINIER PARADISE	51.0	.14	10	15	11.44	2.60	23	15	14	9	2	126	21	110	118	39.0	24.0	31.5	--	--	--	--	--	--	
MT. HOOD MDWS, ORE.	37.5	.17	6	16	14.59	2.26	18	16	15	9	5	120	3	98	106	42.5	28.3	35.4	15.8	66	46	48	280	15	
SNOQUALMIE PASS I-90	22.0	.11	6	4	7.58	1.79	15	11	8	4	2	67	4	41	56	44.0	26.2	35.1	12.0	47	20	--	--	--	
SQUAW VALLEY, CALIF	7.7	.13	3	26	5.33	1.60	17	8	6	3	3	--	--	--	--	44.7	25.8	35.3	--	--	--	--	--	--	
STEVENS PASS 5E WASH	25.0	.26	8	15	13.03	4.08	15	12	12	8	3	72	5	63	66	38.9	25.5	32.2	8.8M	25M	14M	38	100	12	
STEVENS PASS, WASH	31.5	.12	11	15	6.51	2.00	15	12	6	3	2	72	15	62	67	40.3M	26.5M	33.4M	9.7M	20M	15M	--	--	--	
SUGAR BOWL, CALIF	41.0	--	20	24	--	--	--	--	--	--	--	269	25	232	247	46.8M	27.5M	37.2M	9.4M	28M	16M	35	270	24	

-- DATA INCOMPLETE OR MISSING

M-ONE OR MORE DAYS OF RECORD MISSING-IF AVERAGE VALUE IS ENTERED, LESS THAN 10 DAYS RECORD IS MISSING

IF M IS ENTERED IN WIND SPEED COLUMN, LESS THAN 37 6-HOUR PERIODS ARE MISSING

GE--GREATER THAN OR EQUAL TO

U.S. FOREST SERVICE
WESTWIDE WEATHER AND AVALANCHE NETWORK
FORT COLLINS, COLORADO

MARCH 1993
AVALANCHE SUMMARY

AREA	TOTAL	TOTAL	DATES OF		NUMBER OF DAYS WITH		TYPE OF AVALANCHE						FRACTURE LINE HEIGHTS IN FEET	VERTICAL DESCENT IN FEET				AVALS ACROSS MAJOR ACCESS ROADS NO.			
	A V A L S THIS MONTH NO.	A V A L S THIS WINTER NO.	F I R S T T	M A X I N O N E D A Y T E	A V A L S	S L U F S	A R T I F I C I A L	N A T U R A L	SLABS				L O O S E	G E 2	G E 4	G E 6	G E 200		G E 500	G E 1000	M A X F E E T
-----NUMBER-----																					

CENTRAL AND SOUTHERN ROCKY MOUNTAINS

ARAPAHOE BASIN, COLO	3	112	17	24	1 24+	3	0	2	1	0	2	0	1	2	1	1	3	1	1	1000	0
ASPEN HIGHLANDS, COL	26	252	1	29	9 28	10	0	13	13	0	12	8	6	13	0	0	18	8	3	1100	0
ASPEN MOUNTAIN, COLO	19	27	25	28	8 28	4	0	19	0	0	11	6	2	16	6	0	13	5	0	900	0
BERTHOUD PASS U.S.40	1	25	31	31	1 31	1	0	1	0	0	1	0	0	0	0	0	1	1	0	600	0
BERTHOUD PASS, COLO	18	85	7	31	5 31+	8	0	1	17	1	17	0	0	9	2	0	17	10	3	1200	0
GOTHIC, COLO	35	223	2	31	12 28	12	1	0	35	0	5	1	29	3	0	0	34	23	7	1700	0
LOVELAND PASS U.S. 6	1	40	31	31	1 31	1	0	0	1	0	1	0	0	0	0	0	1	1	0	900	0
MONARCH, COLORADO	8	44	15	27	5 27	4	0	5	3	1	7	0	0	2	2	0	5	0	0	450	1
TELLURIDE, COLO	13	127	3	31	3 28+	8	0	9	4	0	12	1	0	5	1	0	11	4	1	1100	0
URAD MINE, COLO	1	34	15	15	1 15	1	0	1	0	0	1	0	0	1	0	0	1	1	1	1000	0
VAIL, COLO	15	38	11	28	9 28	4	0	15	0	0	13	2	0	11	2	0	14	2	0	800	0
WOLF CREEK, COLO	3	120	27	28	2 27	2	0	3	0	0	3	0	0	1	0	0	1	0	0	300	0

INTERMOUNTAIN

BIG MOUNTAIN, MONT	16	95	15	16	12 15	2	0	16	0	0	16	0	0	0	0	0	10	0	0	460	0
BIG SKY, MONT	56	224	15	30	18 15	6	0	56	0	1	55	0	0	7	0	0	56	37	4	1300	0
BRIDGER BOWL, MONT	120	290	3	26	39 21	13	0	87	33	4	81	4	31	22	0	0	119	84	27	1600	0
GRAND TARGHEE, IDAHO	18	18	16	21	10 18	3	0	16	2	0	18	0	0	3	0	0	6	1	0	500	0
JACKSON HOLE, WYO	29	186	15	30	9 15	9	0	27	2	1	25	2	1	14	1	0	29	16	3	1000	0

WEST COAST

ALPENTAL, WASH	26	198	3	4	15	4	2	0	26	0	0	19	7	0	9	0	0	24	13	3	1300	0
ALPINE MEADOWS, CAL	137	1210	18	28	54	24	6	0	117	20	0	118	0	19	1	0	0	134	29	0	800	0
ALYESKA, ALASKA	43	290	10	31	19	11	5	0	38	5	5	37	1	0	22	6	3	43	40	27	1600+	0
CRYSTAL MTN, WASH	26	346	5	23	17	17	3	0	26	0	0	8	18	0	2	0	0	26	6	0	700	0
HEAVENLY VALLEY, CAL	43	213	14	27	21	26	3	0	43	0	0	20	0	23	0	0	0	43	17	0	800	0
KIRKWOOD MDWS, CAL	89	343	17	28	34	24	8	0	74	15	4	66	17	2	33	0	0	85	43	9	1500+	0
MT. HOOD MEADOWS	29	302	2	21	9	16+	7	0	27	2	9	18	2	0	12	1	0	16	8	1	1000	0
SQUAW VALLEY, CALIF	30	721	18	25	23	24	3	0	30	0	0	30	0	0	2	0	0	22	6	0	900	0
STEVENS PASS U.S. 2	7	44	4	15	4	15	2	0	7	0	0	7	0	0	4	0	0	7	4	0	800	0
STEVENS PASS, WASH	146	659	4	23	60	15	5	0	146	0	0	111	2	33	44	0	0	0	0	0	0	0
SUGAR BOWL, CALIF	23	187	24	25	18	24	2	0	23	0	0	23	0	0	6	0	0	20	6	0	700	0

-- = DATA INCOMPLETE OR MISSING
GE = GREATER THAN OR EQUAL TO
+ = ALSO OCCURRED ON OTHER DATES